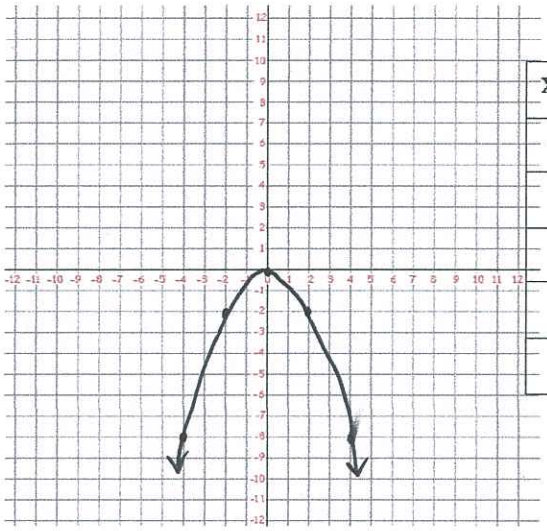
Name: Answer key TP: _____

Semester 1 Final Review
Honors Geometry
Due Date: _____

Unit 1 – Quadratics

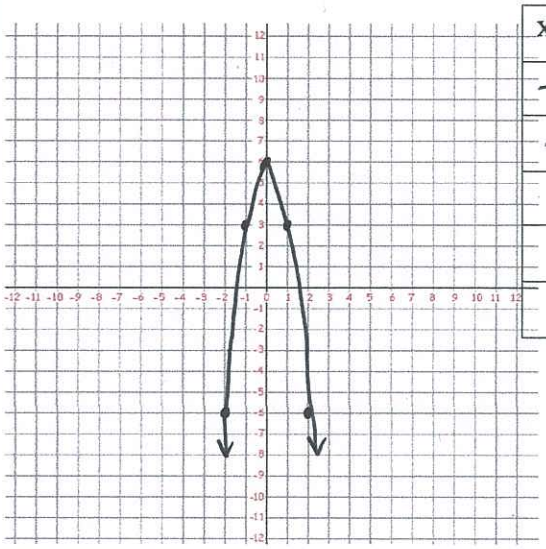
1. Graph the following quadratic equation. $y = -\frac{1}{2}x^2$



x	y
-4	-8
-2	-2
0	0
2	-2
4	-8

Comparison to $y = x^2$: reflection and shrink

2. Graph the following quadratic equation. $y = -3x^2 + 6$



x	y
-2	-6
-1	3
0	6
1	3
2	-6

Comparison to $y = x^2$:
reflection, stretch, shift up by 6

3. Graph $y = 2x^2 - 6x + 2$

Find the vertex: $\frac{-b}{2a} = \frac{6}{2(2)} = \frac{6}{4} = 1.5$

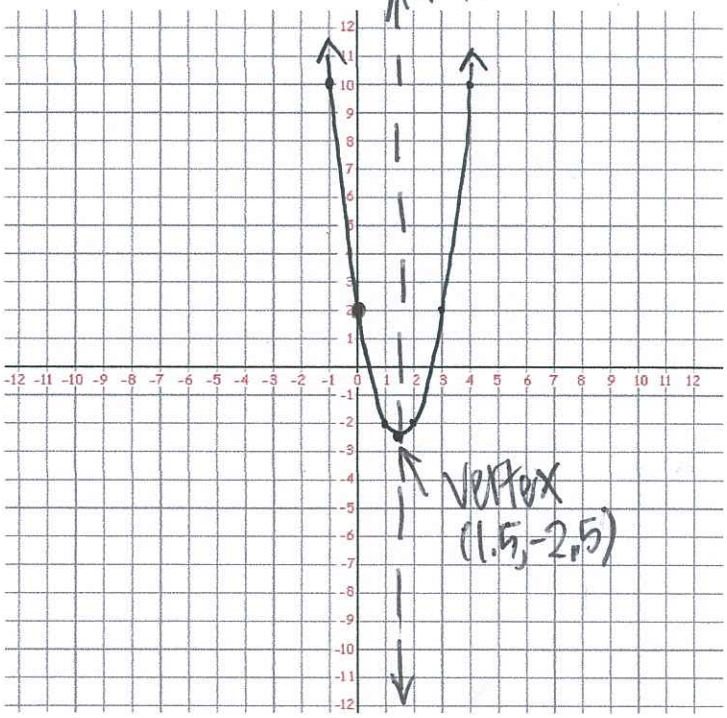
$2(1.5)^2 - 6(1.5) + 2 = -2.5$

Find the axis of symmetry:

Vertex: (1.5, -2.5)

AOS: $x = 1.5$

x	y
-1	10
0	2
1	-2
2	-2
3	2
4	10



4. Graph $f(x) = -\frac{1}{4}x^2 + 2x + 4$

Find the vertex:

$\frac{-b}{2a} = \frac{-2}{2(-1/4)} = \frac{-2}{-.5} = 4$

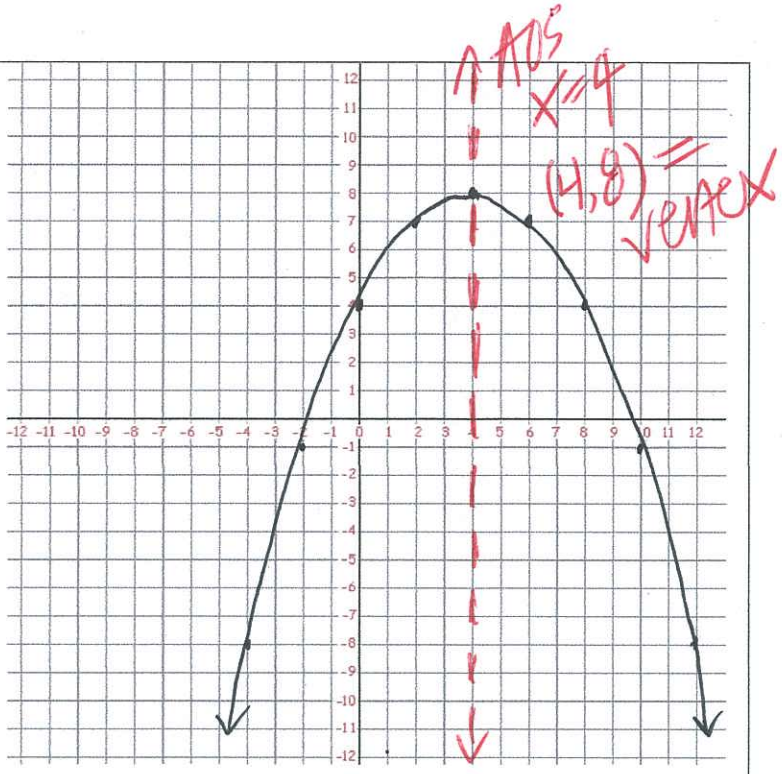
$= \frac{-1}{4}(4)^2 + 2(4) + 4$

Find the axis of symmetry: $= 8$

Vertex: (4, 8)
AOS: x = 4

x	y
-4	-8
-2	-1
0	4
2	7
4	8
6	7

x	y
8	4
10	-1
12	-8



5. Which multiple choice option describes the correct transformation to the parent graph ($y = x^2$)?

$y = -7x^2$

A. Shrink and shift down 1 units
B. Stretch and shift down 3 units
C. Stretch and reflection across the x-axis
D. Shrink, shift down 3 units, and reflection across the x-axis
E. Shrink and reflection across the x-axis

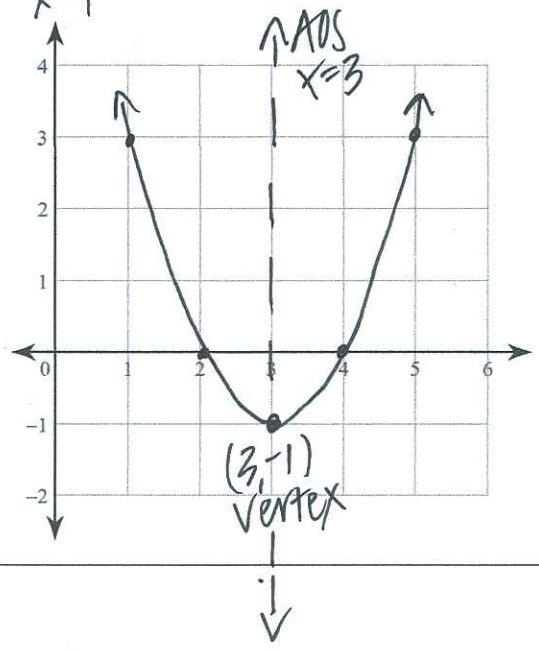
6. How would the graph of the function $y = x^2 + 4$ affected if the function were changed to $y = x^2 - 3$?

A. The graph would shift 4 units up.
B. The graph would shift 3 units down.
C. The graph would shift 7 units down.
D. The graph would shift 4 units to the right.
E. The graph would shift 4 units down.

9. Solve the equation by graphing. Label the vertex and axis of symmetry.

$y = x^2 - 6x + 8$

x = 2
x = 4

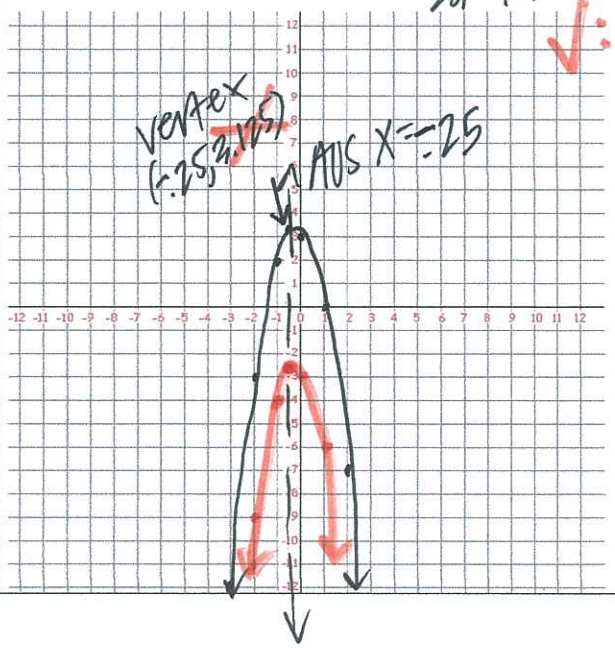


10. Find the zeros, if any, of $-2x^2 - x - 3$. Label the vertex and axis of symmetry.

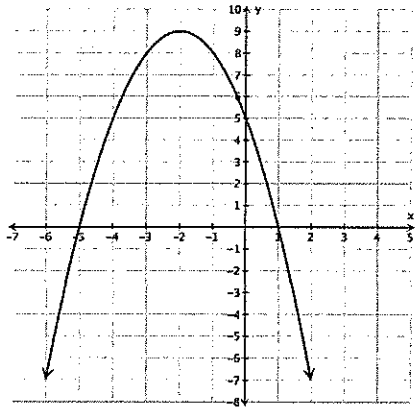
NO SOLUTION

$\frac{-b}{2a} = \frac{1}{-4} = -.25$

V: (-.25, -2.875)



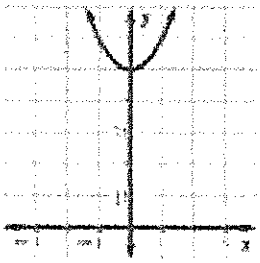
11. The graph $y=-x^2-4x+5$ is shown below. Which choice best describes the solution(s) to this equation?



A. $x=-5$ ✓
B. $x=5$
C. $x=1$ ✓
D. Both A and C

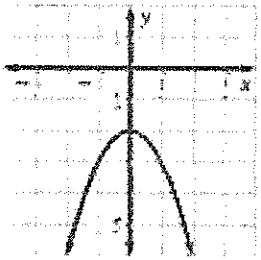
12. Use the graph to find the solution to the equation

a. $x^2+5=0$



NO solution (doesn't cross x-axis)

b. $x^2-2=0$



NO solution

13. What are the solutions to the quadratic equation $x^2+7x+10=0$?

$(x+2)(x+5)=0$ $x+2=0$ $x+5=0$
$-2,-5$ $x=-2$ $x=-5$

A. $x=2$ *and* $x=5$
B. $x=-2$ *and* $x=5$
C. $x=-5$ *and* $x=2$
D. $x=-5$ *and* $x=-2$

14. The expressions x^2 and $7x-12$ are equivalent when x is equal to what value(s)?

$x^2=7x-12$
$x^2-7x+12$
$(x-3)(x-4)=0$
$x-3=0$ $x-4=0$
$x=3,4$

15. The expressions $4b^2$ and $-2b+2$ are equivalent when b is equal to what value(s)?

$4b^2=-2b+2$
$4b^2+2b-2$ $2(2b^2+b-1)$
$(2b-1)(b+1)$
$b=\frac{1}{2}$ & $b=-1$

16. What is the ***sum*** of the solutions to the equation?

$12d^2+14d-6=0$
$2(6d^2+7d-3)=0$
$2(2d+3)(3d-1)$
$d=-\frac{3}{2}$ $d=\frac{1}{3}$
$-\frac{3}{2}+\frac{1}{3}$
$=-\frac{7}{6}$ or -1.167

17. Solve the equation $5+3p^2=38$

$3p^2=33$
$\sqrt{p^2}=\sqrt{11}$

Exact answer: $p=\pm\sqrt{11}$

Approximate answer (evaluate radical and round to the nearest hundredth): $p=\pm 3.32$

19. Solve the equation:

$2a^2 - 4 = -13$

$2a^2 = -9$

$a^2 = -4.5$ NO real solution

20. Solve the equation:

$4(x+9)^2 = 24$

$\sqrt{(x+9)^2} = \sqrt{6}$

$x+9 = \pm\sqrt{6}$

$x = -9 \pm \sqrt{6}$

$= -6.55, -11.45$

22. What is the quadratic formula?

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

22. What are the roots of $4z^2 = 7z + 2$?

$4z^2 - 7z - 2 = 0$

a = 4
b = -7
c = -2

$$x = \frac{7 \pm \sqrt{7^2-4(4)(-2)}}{2(4)}$$

$$= \frac{7 \pm \sqrt{81}}{8} \quad \frac{7 \pm 9}{8}$$

$= 2, -\frac{1}{4}$

Find the discriminant and use it to determine if the solution has *one real*, *two real*, or *two imaginary* solution(s).

1. $x^2 + 4x - 1 = 0$ 2 real sol'n $\sqrt{b^2-4ac} = \sqrt{16-4(-1)} = \sqrt{20}$
2. $x^2 - 2x + 1 = 0$ 2.) $\sqrt{2^2-4(1)(1)}$ $4-4$ $\sqrt{0}$ one real sol'n
3. $2x^2 - 3x + 1 = 0$
4. $7x^2 + 6x + 2 = 0$
5. $-3x^2 + 9x = 4$ $-3x^2 + 9x - 4$
6. $10x^2 - 2x + 2 = 3x - 4$ $10x^2 - 5x + 6$

3.) $\sqrt{-3^2-4(2)(1)}$ $\sqrt{9-8} = \sqrt{1}$ two real sol'n

4.) $\sqrt{b^2-4(7)(2)}$ $36-56$ -20 NO real sol'n

5.) $\sqrt{9^2-4(-3)(-4)}$ $81-48$ $\sqrt{33}$ two real

6.) $5^2-4(10)(6)$ $25-240$ NO real sol'n

Use the discriminant to find all values of *b* for which the equation has one real solution. $\sqrt{b^2-4ac} = 0$

19. $x^2 - bx + 4 = 0$
20. $3x^2 + bx + 5 = 0$
21. $2x^2 - bx - 9 = 0$

Use the discriminant to find all values of *c* for which the equation has two real solutions.

22. $3x^2 - 4x + c = 0$
23. $2x^2 + 5x + c = 0$
24. $2x^2 - x - c = 0$

19. $\sqrt{b^2-4(1)(4)} = 0$ $b^2 - 16 = 0$ $b^2 = 16$ $b = \pm 4$

20. $\sqrt{b^2-4ac} = 0$ $\sqrt{b^2-4(3)(5)} = 0$ $b^2 - 60 = 0$ $b^2 = 60$ $b = \pm\sqrt{60}$

21.) $\sqrt{b^2-4(2)(-9)} = 0$ $b^2 + 72 = 0$ $b^2 = -72$ No real sol'n

22.) $b^2-4ac > 0$ $4^2-4(3)(c) > 0$ $16 - 12c > 0$ $-12c > -16$ $c < 4/3$

23. $25-4(2)(c) > 0$ $25 - 8c > 0$ $-8c > -25$ $c < \frac{25}{8}$

24. $1 - 4(2)(c) > 0$ $-8c > -1$ $c < \frac{1}{8}$

GRASP quadratic problem.

29) During a "big air" competition, snowboarders launch themselves from a half pipe, perform tricks in the air, and land back in the half pipe. The snowboarder starts her jump at 16.4 feet with an initial velocity of 24 feet per second.

a. Write a vertical motion model to represent the snowboarder's jump.

b. How long is the snowboarder in the air if she lands 13.2 feet above the base of the half pipe? Round your answer to the nearest hundredth.

c. At what time does the snowboarder hit the ground if she lands at the base of the half pipe?

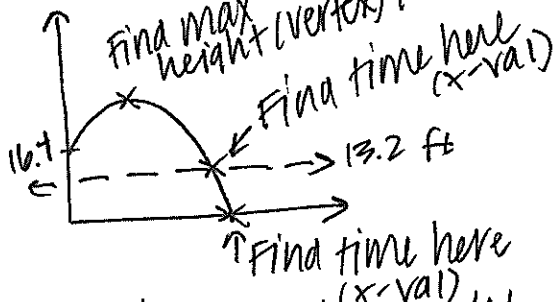
d. What is the maximum height of the snowboarder?

G: a.) write a quadratic equation.
b.) Find out how long the boarder has been in the air when is 13.2 ft above base.
c.) Find out how long it will take boarder to reach ground.
d.) Find the max height of snowboarder.

R: a.) vertical motion model $h(t) = -16t^2 + \square t + \square$ (initial velocity; initial height)

$V_0 = 24$ ft/sec $h_0 = 16.4$ ft

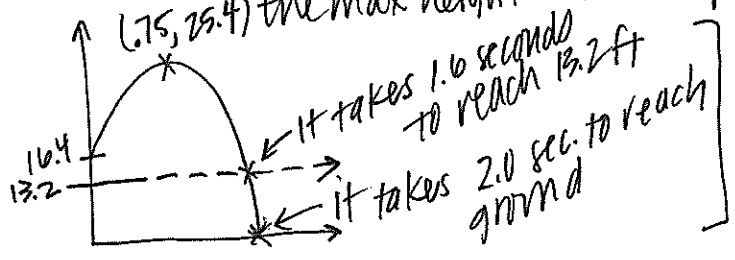
b.)
c.)
d.)



A: a.) use vertical motion model
b.) use intersect (#5) on calc
c.) use zero (#2) on calc
d.) use max (#4) on calc

S: a.) $-16t^2 + 24t + 16.4$
b.) it takes 1.6 seconds to reach height of 13.2 ft
c.) it takes 2.00 seconds to reach the ground.
d.) the maximum height is 25.4 ft.

P: (1.75, 25.4) the max height of 25.4 is greater than the initial height.



time makes sense b/c it is in order

Unit 2 – Foundation of Geometry

1. What is the different between a ray and a line?

A ray has an endpoint and goes through a 2nd point forever. A line goes on forever in both directions.

2. Write the necessary notation above "AB" to demonstrate that (a.) is a line, (b.) is a line segment, and (c.) is a ray.

(a.) $\overleftrightarrow{AB}$ (b.) $\overline{AB}$ (c.) $\overrightarrow{AB}$

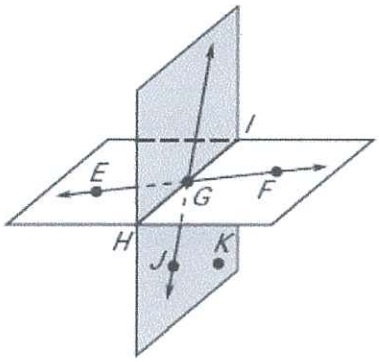
3. Use the diagram to decide whether the given statement is *true* or *false*.

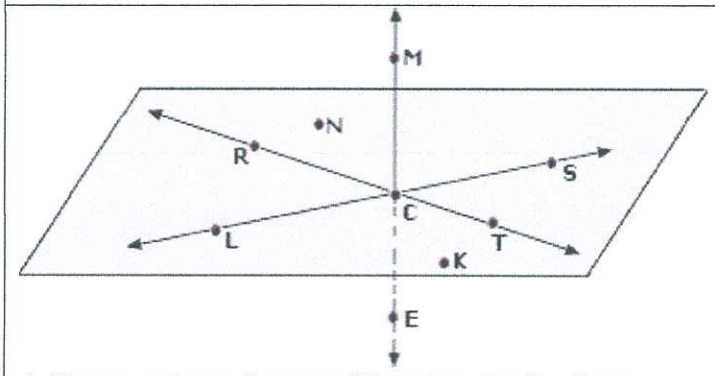
a. Points E, G, and F are collinear. true

b. Points E, G, and F are coplanar. true

c. Points *H*, *I*, and *G* are collinear. true

d. Points *H*, *I*, and *J* are coplanar. true

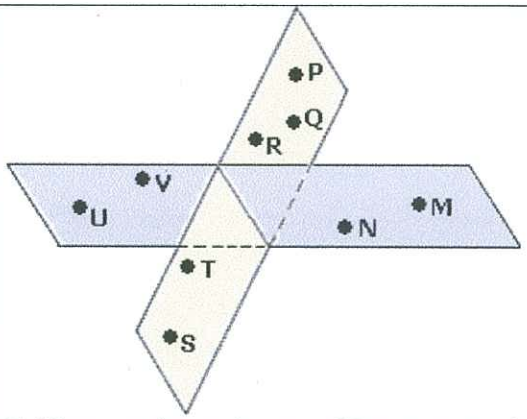




4. Name at least 3 sets of 3 points in the figure above that are collinear.

A. R C T
B. L C S
C. M C E

} ans will vary



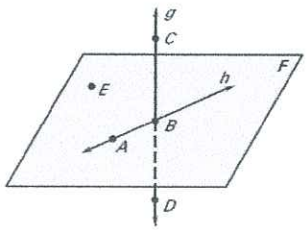
5. Name at least 3 sets of 3 points in the figure above that are coplanar.

A. U V N
B. P Q T
C. S R P

} ans will vary

Foundations of Geometry?

Score _ / 4



1. Give two names for the plane.

Plane F, Plane E, A, B

2. Give two names for line *g*.

$\overleftrightarrow{CB}$ $\overleftrightarrow{BD}$

3. Name two points that are not coplanar.

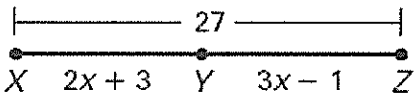
C, D

4. True or False: Points C, B, and D are collinear.

True

Line Segments?

Score __ / 4



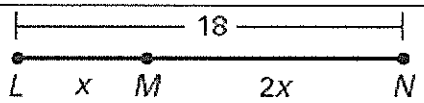
5. Find x.

$5x + 2 = 27$

$x = 5$

6. Find *XY*.

$= 13$



7. Find x.

$x = 6$

8. Find MN.

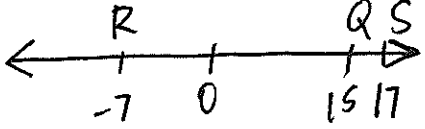
12

Distance and Absolute Value?

Score __ / 4

On a number line, point Q is located at 15, point R is located at -7, and point S is located at -17.

7. Draw a number line.



8. What is the length of QS?

2

9. What is the length of RS?

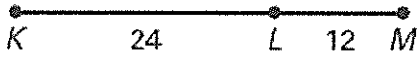
24

10. How much longer is Segment QS than RS?

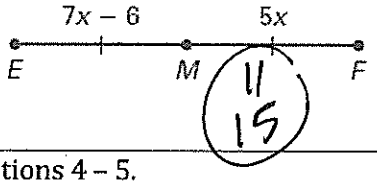
RS is 22 units longer

2) Find *KM*.

$= 36$



3) Find *MF*.



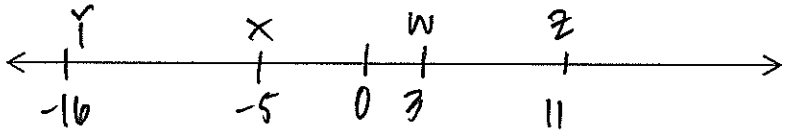
$7x - 6 = 5x$

$2x = 6$

$x = 3$

Use the description of a number line below to answer questions 4 – 5.

On a number line, point W is located at 3, X is located at –5, Y is located at –16, and Z is located at 11.



4) What is the distance, in coordinate units, between points *W* and *Z*?

8

5) What is the distance, in coordinate units, between points *W* and *Z*?

6) Write the midpoint formula:

$\frac{x_1 + x_2}{2} = x_m \quad \frac{y_1 + y_2}{2} = y_m$

7) Write the distance formula:

$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} = d$

8) Find the coordinates of the midpoint of the segment with the given endpoints.

a. $R(3, 1)$ and $S(3, 7)$ (3, 4)

b. $V(2, 4)$ and $W(6, 6)$ (4, 5)

9) Find the distance of the segments with the given endpoints. **Leave your answers in reduced radical form.**

a. $A(-6, 4)$ and $B(0, 7)$

$(-6)^2 + (3)^2$
$36 + 9$ $\sqrt{45} = \boxed{3\sqrt{5}}$

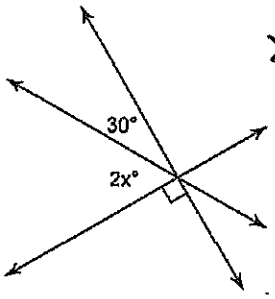
b. $X(-1, 8)$ and $Y(6, 1)$

$(7^2) + (-7)^2$
$49 + 49$ $\sqrt{98} = \boxed{7\sqrt{2}}$

Unit 3 – Angles!

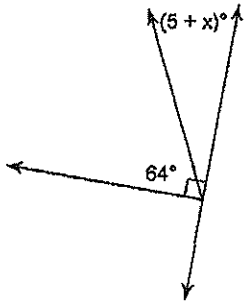
Find the value of x and indicate which angle relationship you used.

1)



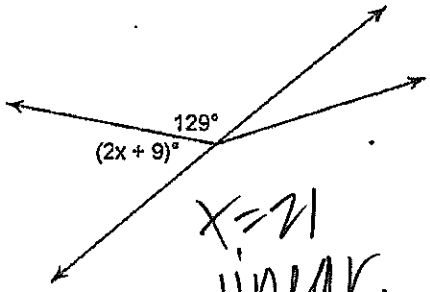
x = 30
complementary

2)



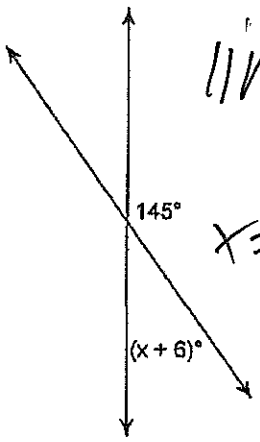
x = 21
complementary

3)



x = 21
linear pair/ supplementary

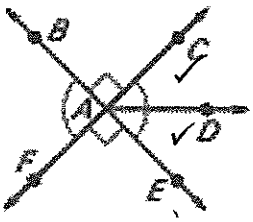
4)



linear pair

x = 29

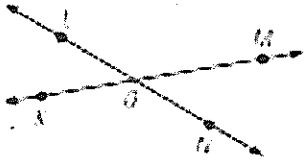
5) Name the acute angles in the given figure:



∠CAD
∠DAE

6) Which of the following is vertical to $\angle LQK$?

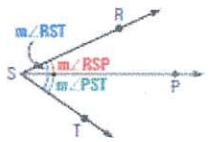
a. $\angle LQM$
b. $\angle MQN$
c. $\angle NQK$
d. $\angle QMN$



3) Use the following **together** in a complete sentence:
a) bisecting line, b) angle, c) congruent

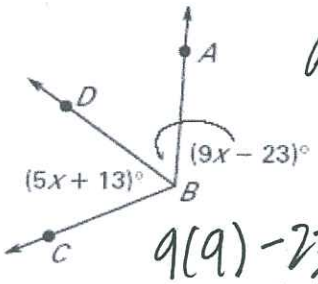
A line that bisects an angle creates two congruent angles.

4) Make a statement using ∠RSP, ∠PST, and ∠RST that demonstrates the angle addition postulate.



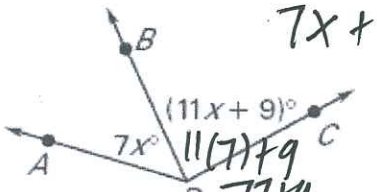
∠RSP + ∠PST = ∠RST

5) *BD* bisects ∠*ABC*. Find m∠*ABC*.



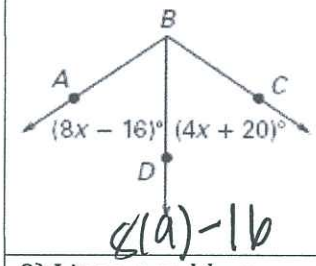
$9x - 23 = 5x + 13$
$4x = 36$
$x = 9$
$9(9) - 23$
$\angle ABC = 116°$

6) Given $m\angle ADC = 135°$, find $m\angle BDC$.



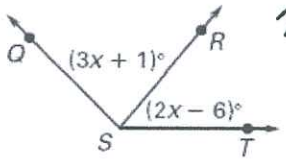
$7x + 11x + 9 = 135$
$18x = 126$
$x = 7$
$11(7) + 9$
$77 + 9$
86°

7) *BD* bisects ∠*ABC*. Find *m*∠*ABC*.



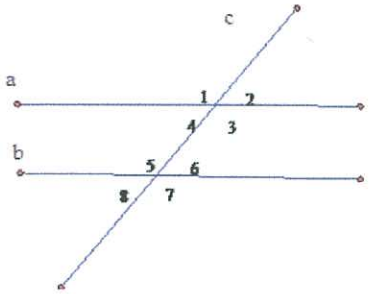
$8x - 16 = 4x + 20$
$4x = 36$
$x = 9$
$8(9) - 16$
$\angle ABC = 112°$

8) Given $m\angle QST = 135°$, find $m\angle QSR$.



$3x + 1 + 2x - 6 = 135$
$5x = 140$
$x = 28$
$3(28) + 1$
85°

9) Lines *a* and *b* are parallel and cut by transversal *c*. List the angle pairs to the right.



Vertical: 1,3 2,4 5,7 6,8

Alternate Interior: 4,6 3,5

Corresponding: 1,5 2,6 4,8 3,7

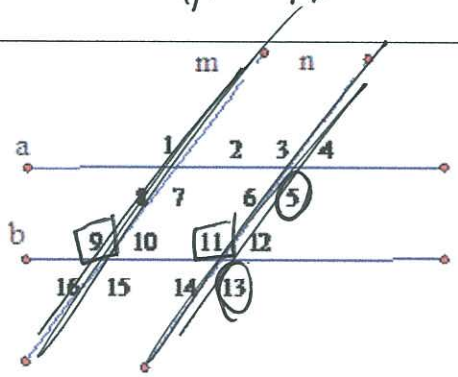
Alternate Exterior: 1,7 2,8

Consecutive Interior: 4,5 3,6

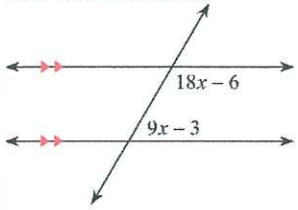
10. If ∠5 ≅ ∠13 and ∠9 ≅ ∠11, then which pairs of lines, if any, must be parallel?

a. ~~*a* ∥ *b* only~~
b. ~~*m* ∥ *n* only~~
c. *a* ∥ *b* and *m* ∥ *n*
d. No lines must be parallel
e. Cannot be determined from the given information

BOTH



11. Solve for x.

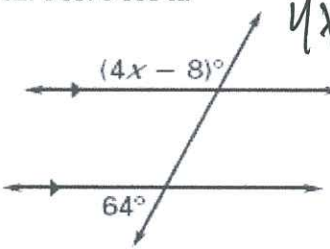


$18x-6+9x-3=180$

$27x-9=180$

$x=7$

12. Solve for x.

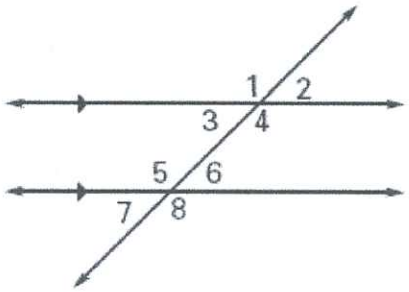


$4x-8+64=180$

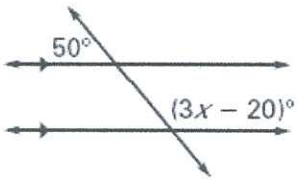
$x=31$

13. State the relationship between the two angles.

1. ∠1 and ∠5 corresp.
2. ∠5 and ∠8 vertical
3. ∠4 and ∠5 alt int
4. ∠2 and ∠7 alt ext
5. ∠3 and ∠5 consec int
6. ∠6 and ∠8 linear pair



14. What is the value of x?

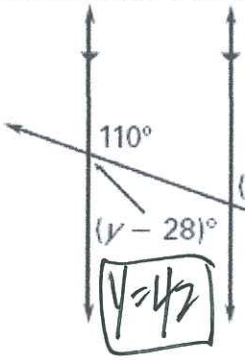


A. 40
B. 50
C. 60
D. 70

$50+3x-20=180$

$x=50$

15. Find the value of x and y.

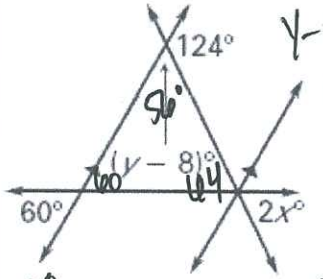


$5x+15=110$

$x=19$

$y=42$

16. Find the value of x and y.



$y-8+124=180$

$y=64$

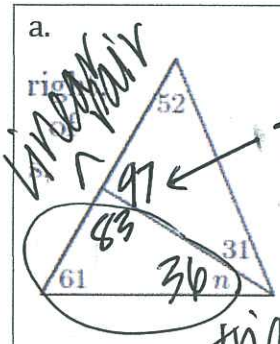
$180-60-56=64$

$2x=64$

$x=32$

17. In the diagrams below, the goal is to find the sizes of the angle marked with letter, using the given numerical information. Angles are measured in degrees. Notice the custom of marking arrows on lines to indicate that they are known to be parallel. List any angle relationships you used to solve.

a.



linear pair

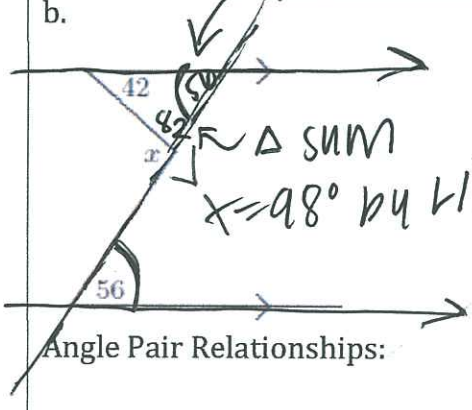
triangle sum thm

$n=36°$

triangle sum

Angle Pair Relationships:

b.



alternate int

$\triangle$ sum

$x=98°$ by linear pair

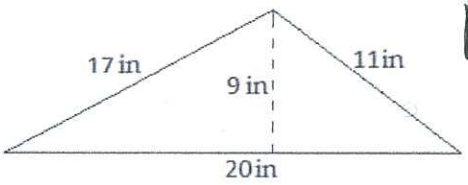
Angle Pair Relationships:

Unit 4 – Area and Perimeter

1) Fill in the following formulas.

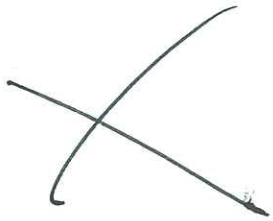
	Perimeter	Area
Triangle	$P = s_1 + s_2 + s_3$	$A = \frac{1}{2} \cdot b \cdot h$
Square	$4s$	s^2
Rectangle	$2l + 2w$	$l \cdot w$
Circle	$C = \pi d$, $C = 2\pi r$	$A = \pi r^2$

2) Find the **perimeter and area** of the triangle below.

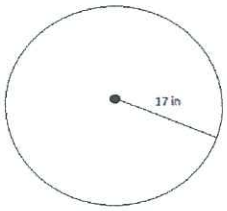


$P = 48$ in
$A = 90$ in^2

3) Find the **perimeter and area** of the floor plan below.



4) What is the circumference of the circle?



$C = 34\pi$

5) What is the length of the radius of a circle with an area of 196π cm?

$A = \pi r^2 = 196\pi$
$r^2 = 196$
$r = 14$

6) What the sum of the interior angles of a triangle?

$180°$

7) What is the sum of the interior angles of a quadrilateral?

$360°$

8) Find the measure of angle A.

9) What is the measure of angle W in the figure below?

10. The surface area of a rectangular prism is given use the formula $A = 2(lw) + (2l + 2w)h$ where l is the length, w is the width, and h is the height of the prism. Find the surface area of a prism with a length of 5 cm, a width of 6 cm, and a height of 8 cm.

$2(30) + (10 + 12)8$
$60 + (22)8$
236 cm^2

$l = 5$
$w = 6$
$h = 8$

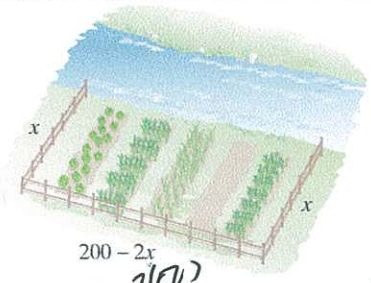
11. A Campbell's soup can has a diameter of 3 inches and a height of 5 inches. Given that the formula for the volume of a cylinder is $V = \pi r^2 h$, how many cubic inches of soup fit in the can?

$d = 3$
$r = 1.5$
$h = 5$

$\pi \cdot 1.5^2 \cdot 5$
7.25π in^3

12)

You have 200 feet of fencing to enclose a rectangular plot that borders on a river. If you do not fence the side along the river, find the length and width of the plot that will maximize the area. What is the largest area that can be enclosed?



Verbal:
Write solutions: 200 ÷ 2(2) = 100 length = 100 ft
Width = x = 50 ft will maximize area of 5,000 ft²

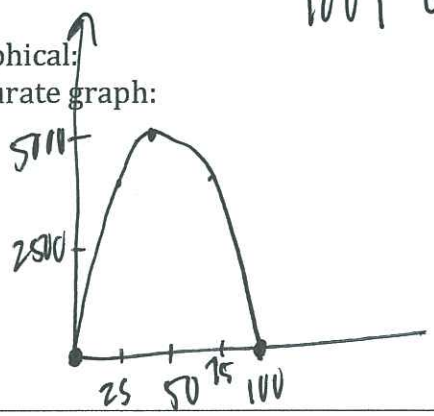
Analytical:
Write a quadratic equation P = 200 P = 2L + 2W
200 = 2X + 200 − 2X − river

$A = x(200-2x)$
$= 200x - 2x^2$
$= -2x^2 + 200x$

Numerical:
Table (at least 5 values)

0	0
25	3750
50	5000
75	3750
100	0

Graphical:
Accurate graph:



13)

1. You have 80 yards of fencing to enclose a rectangular region. Find the dimensions of the rectangle that maximize the enclosed area. What is the maximum area?

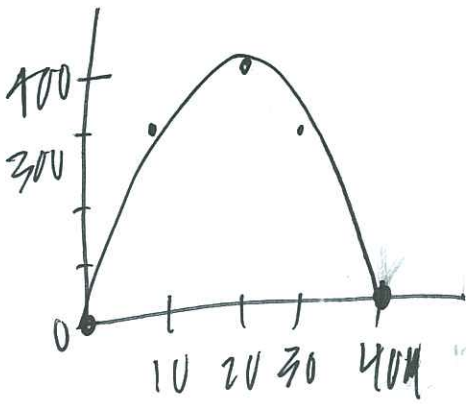
Verbal:
Write solutions:
length & width = 20 each
area = 400 yd²

Analytical:
Write a quadratic equation

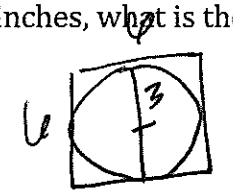
x	y
0	0
10	300
20	400
30	300
40	0

Numerical:
Table (at least 5 values)
$80 = 2x + 2y$
$40 - x = y$
$A = xy$
$= x(40-x)$
$= 40x - x^2 \rightarrow -x^2 + 40x$

Graphical:
Accurate graph:



14) A circle is inscribed within a square such that the edges of the circle touch each of the four sides of the square. If the area of the square is 36 square inches, what is the area of the circle?



$A = 9\pi$

15)

). A rectangle is 4 times as long as it is wide. The area of the rectangle is 196 square centimeters. What is the perimeter of the rectangle, in centimeters?

A. 35
B. 56
C. 70
D. 88
E. 119

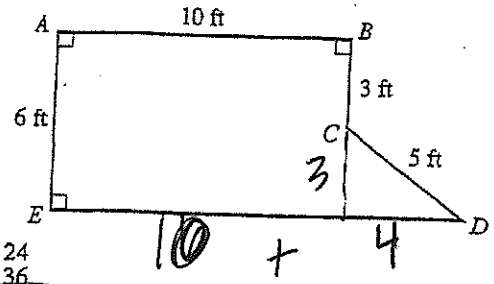
$4x^2 = 196$

$x = 7$

$2(7)+2(28)$

16)

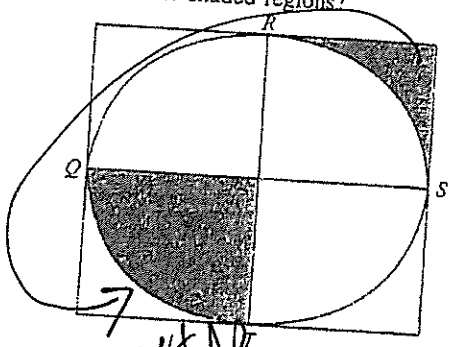
. In polygon $ABCDE$ shown below, the angles at A, B, and E are right angles. What is the perimeter of the polygon, in feet?



A. 24
B. 36
C. 38
D. 41
E. 44

17)

15. In the figure below, a square is circumscribed about a circle with a diameter of 20 cm. Points Q, R, S, and T are the midpoints of the square's sides. What is the total area, in cm^2, of the shaded regions?



A. 20
B. 78.5
C. 100
D. 314
E. 400

$A = \pi r^2$

$\pi(20) = \frac{400}{4} = 100$

Unit 5 – Intro to Proofs

Some of the following conjectures are true and some can be proven false using a counterexample. If the statement is true, write the word TRUE in the box. For statements that are false, provide a counterexample.

1) Conjecture: The square of an odd integer is odd.	**2) Conjecture:** If n is a real number then –n is a negative number.
$7^2 = 49$ $9^2 = 81$ true	False $-(-2) = 2$

Rewrite the conditional statements in if-then form.

3) The measure of a straight angle is 180°.	4) Congruent segments are segments that are equal in measure.
IF-THEN FORM: If an angle is straight, then it is 180°	**IF-THEN FORM:** If a segment is $\cong$, then they are $=$ in measure

5) What is the difference between inductive and deductive reasoning?

guess based on pattern

based on facts/rules

Write the converse, inverse, and contrapositive for each conditional statement that is given. Then decided whether each statement is *true* or *false*.

True/False

6) Conditional Statement	If x = -6 , then |x| = 6	T
Converse	If $\|x\| = 6$, then $x = -6$	F
Inverse	If $x \neq -6$, then $\|x\| \neq 6$	F
Contrapositive	If $\|x\| \neq 6$, then $x \neq -6$	T

7)

Read the following statements:

a) *I scored below 60% on the past 3 tests. The next test I take will also be below a 60%.*

b) *If I score below a 60% on a test, then I earned an F. I earned an F on my last test therefore, I scored below 60%.*

Are both statements always true? Explain your thinking in at least 2 sentences.

F — No inductive

T — Yes, deductive

8)

Part 2: Identify

Below is a bunch of situations. **Circle** all situations that use **deductive** reasoning.

$\overleftrightarrow{AB}$ and $\overleftrightarrow{FG}$ do not intersect. Therefore AB || FG.		If you are ~~48 inches tall,~~ you can ride the new ride at Great America. You rode the new ride, so you are ~~taller than~~ 48 inches.
A regular Hexagon has a side length of 3 inches. The sum of all side lengths is 18 inches.	Students go to school Monday thru Friday. Today is Monday, so all students are in school.	1, 5, 9, 13...

Completing Statements Use the property to complete the statement.

10. *Reflexive Property of Equality:* $JK =$ JK

11. *Symmetric Property of Equality:* If $m\angle P = m\angle Q$, then ? = ?. ∠Q ∠P

12. *Transitive Property of Equality:* If $AB = BC$ and $BC = CD$, then AB = CD.

13. *Reflexive Property of Congruence:* ? ≅ ∠GHJ ∠GHJ

14. *Symmetric Property of Congruence:* If ? ≅ ?, then ∠XYZ ≅ ∠ABC. ∠ABC ∠XYZ

15. *Transitive Property of Congruence:* If $\overline{GH} \cong \overline{IJ}$ and ? ≅ ?, then $\overline{GH} \cong \overline{PQ}$. IJ GH

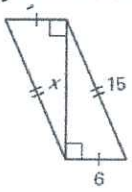
Naming Properties Name the property that the statement illustrates.

16. If $AB = CD$, then $AB + EF = CD + EF$. addition prop

17. If $m\angle C = 90°$, then $2(m\angle C) + 15° = 2(90°) + 15°$. dist.

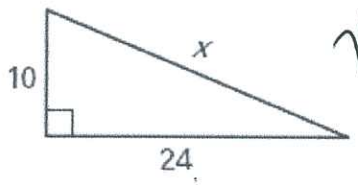
18. If $XY = YZ$, then $3 \cdot XY = 3 \cdot YZ$. subs

19) Find the missing side length. Reduce all radicals.



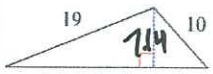
$\sqrt{189}$
$3\sqrt{21}$

20) Find the missing side length. Reduce all radicals.



$\sqrt{476}$
$x = 26$

21) Find the area of the triangle below. Round to the nearest hundredth.

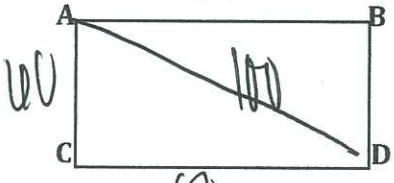


$\sqrt{51} = 7.14$

$\sqrt{210} =$

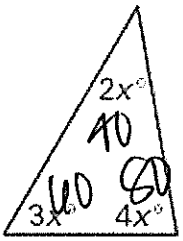
$A = 87.8$

22) A rectangular field shown below is 60 feet wide and 80 feet long. Jaylin and Joyce are at point A. Jaylin walks to point D by walking along the edge of the field through point B. Joyce walks to point D by walking diagonally across the field. About how many meters more does Jaylin walk than Joyce?



140
−100
40 more

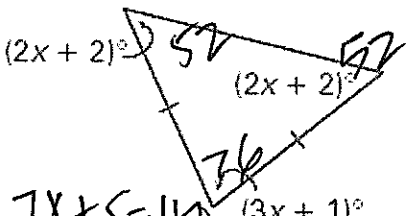
23) Solve for x.



$x=20$

Classified by sides scalene
Classified by angles acute

24) Solve for x.

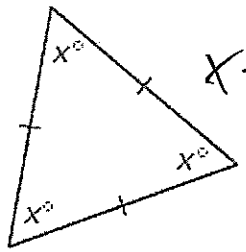


$7x+5=180$

$x=25$

Classified by sides isosceles
Classified by angles acute

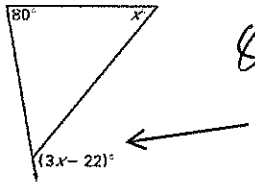
25) Solve for x.



$x=60$

Classified by sides equilateral
Classified by angles equiangular

26) Solve for x. Then find the measure of the indicated angle.



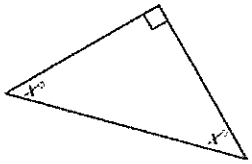
$80+x=3x-22$

$102=2x$

$x=51$

Which theorem is used to solve this problem?
a) Triangle Sum Theorem
b) Exterior Angle Theorem

27) Solve for x.

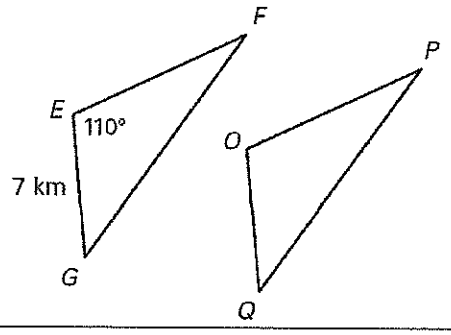


$x=45$

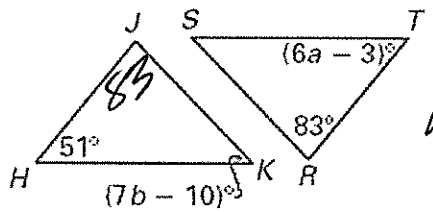
Which theorem is used to solve this problem?
a) Triangle Sum Theorem
b) Exterior Angle Theorem

In the diagram, $\Delta EFG \cong \Delta OPQ$. Complete the statement.

1. $\overline{EF} \cong \overline{OP}$
2. $\angle P \cong \angle F$
3. $\angle G \cong \angle Q$
4. $m\angle O = \angle E$
5. $QO = GE$
6. $\Delta GFE \cong \Delta QPO$



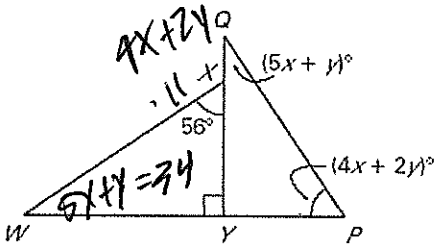
22. Given $\Delta HJK \cong \Delta TRS$, find the values of a and b.



$a=9$

$b=4$

23. Find the value of x and y.



$4x+2y$

$5x+y=34$

$-2(5x+y=34)$

$4x+2y=56$

$-10x-2y=-68$

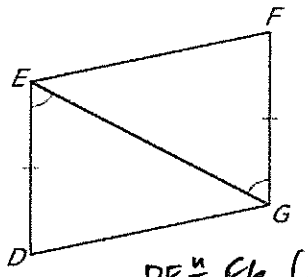
$-6x=-12$

$x=2$

$y=24$

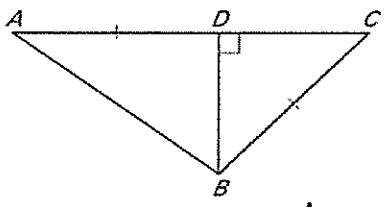
For #24- 29, determine if the two triangles are congruent. If so, write a congruency statement and identify what postulate is needed to prove congruency.

24)



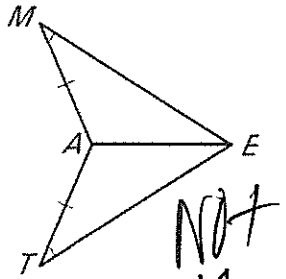
- $DE \cong FG$ (G)
- $\angle DEG \cong \angle FGE$ (G)
- $EG = EG$ (R)
- $\triangle DEG \cong \triangle FGE$ (SAS)

25)



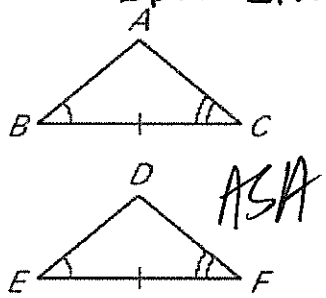
NOT $\cong$

26)



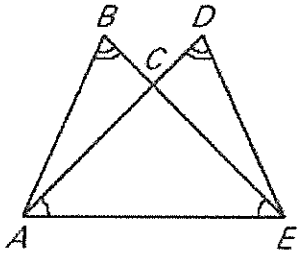
NOT $\cong$

27)



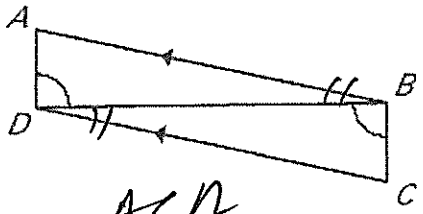
ASA

28)



AAS

29)



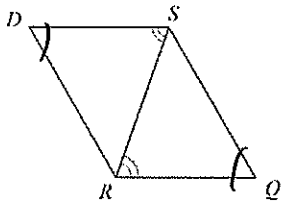
ASA

Proving Congruent Triangles

1) Prove the following:

Given $\angle D \cong \angle Q$

Prove $\Delta DSR \cong \Delta QRS$



$\angle D \cong \angle Q$ - g

$\angle DSR \cong \angle QRS$ - g

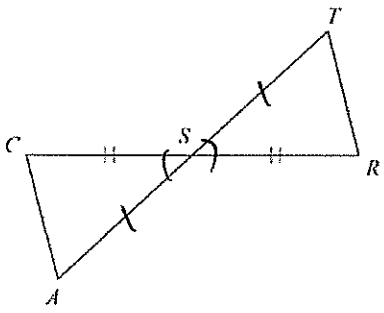
$SR \cong SR$ - reflexive

$\triangle DSR \cong \triangle QRS$ - AAS

2) Prove the following:

Given $\overline{\angle AS} \cong \overline{\angle TS}$

Prove $\Delta CAS \cong \Delta RTS$



$AS \cong TS$ - g

$CS \cong RS$ - g

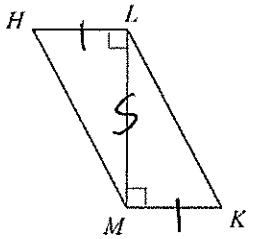
$\angle CSA \cong \angle RST$ - vertical

$\triangle CAS \cong \triangle RTS$ - SAS

3) Prove the following:

Given $HL \cong KM$

Prove $\Delta HLM \cong \Delta KML$



HL ≅ MK - g

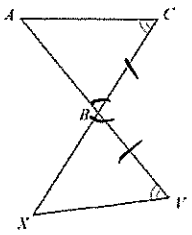
LM ≅ LM - g reflex

ΔHLM ≅ ΔKML - HL

4) Prove the following:

Given $CB \cong VB$

Prove $\Delta ABC \cong \Delta XBV$



CB ≅ VB - g

∠C ≅ ∠V - g

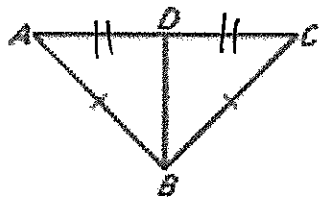
∠CBA ≅ ∠VBX - vertical

ΔABC ≅ ΔXBV - ASA

5) Complete the proof.

GIVEN: $AB \cong CB$, D is the midpoint of AC

PROVE: $\Delta ABD \cong \Delta CBD$

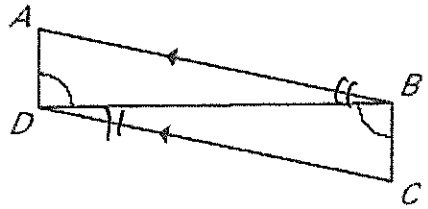


Statements	Reason
1. $AB \cong CB$	1. given
2. D is the midpoint of AC	2. given
3. AD ≅ CD	3. def'n midpt
4. DB ≅ DB	4. reflexive
5. $\Delta ABD \cong \Delta CBD$	5. SSS

6) Write a proof

GIVEN: $\overline{AB} \parallel \overline{DC}$ and $\angle ADB \cong \angle CBD$

PROVE: $\Delta ABD \cong \Delta CDB$



AB ∥ DC ∠ADB ≅ ∠CBD

DB ≅ DB

∠ABD ≅ ∠CDB

ΔABD ≅ ΔCDB

g

reflexive

alt int

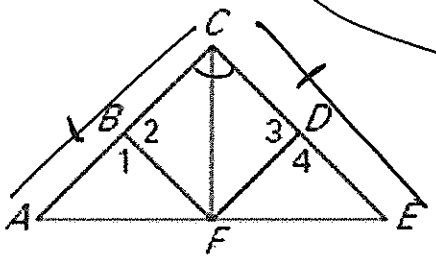
ASA

7) Prove the following:

Given: CF bisects $\angle ACE$

$CA \cong CE$

Prove: $\triangle ACF \cong \triangle ECF$

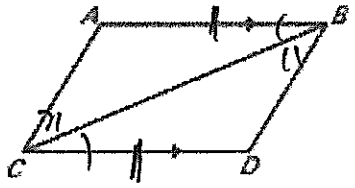


$\angle ACF \cong \angle ECF$	def'n angle bisect.
$CF \cong CF$	reflexive
	SAS

8)

GIVEN: $\overline{AB} \parallel \overline{CD}, \overline{AB} \cong \overline{CD}$

PROVE: $\triangle ABC \cong \triangle DCB$



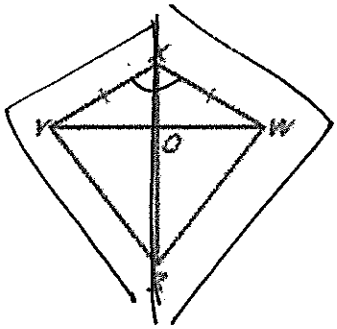
given	
$CB = CB$	reflexive
$\angle ABC \cong DCB$	alt int
$\angle BCA \cong \angle DBC$	alt int
	SAS

9)

GIVEN: $\overline{YX} \cong \overline{WX}$

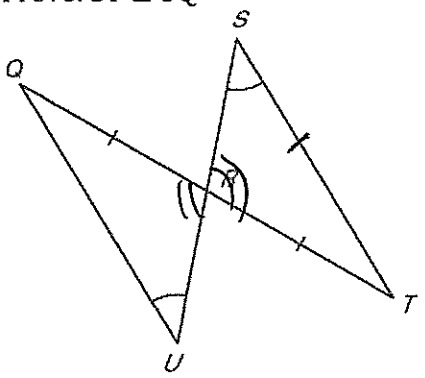
$\overline{ZX}$ bisects $\angle YXW$

PROVE: $\overline{YZ} \cong \overline{WZ}$



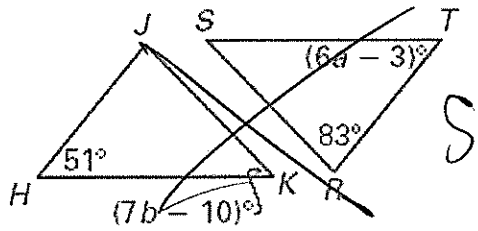
S	R
	given
$\angle YXO \cong \angle WXO$	def'n angle bisect
$XZ \cong XZ$	reflex
$\triangle YXZ \cong \triangle WXZ$	SAS
$YZ \cong WZ$	CPCTC

10)
Given: In figure
Prove: ST ≅ UQ



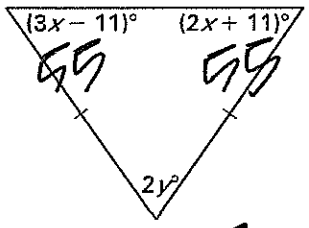
S	R
$QR \cong TR$	given
$\angle U \cong \angle S$	given
$\angle QRU \cong \angle TRS$	vertical
$\triangle QRU \cong \triangle TRS$	AAS
$ST \cong UQ$	CPCTC

15) Given $\Delta HJK \cong \Delta TRS$, find the values of a and b.



same

16) Find the values of x and y in the diagram.



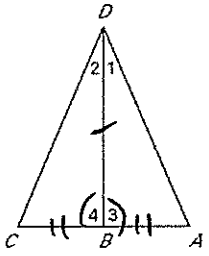
$3x - 11 = 2x + 11$

$x = 22$

$2y = 70$

$y = 35$

17) GIVEN: $\overline{BD}$ bisects CA
$\overline{DB} \perp \overline{AC}$
PROVE: ΔADC is isosceles



S	R
$CB \cong AB$	def seg bisector
$\angle 4 = 90°$ $\angle 3 = 90°$	def ⊥
$\angle 3 \cong \angle 4$	subs
$\overline{DB} \cong \overline{DB}$	reflexive
$\Delta DBC \cong DBA$	SAS
$\overline{CD} = AD$	CPCTC
ΔADC is isos	def of isos